

## POLYMERIC GENE DELIVERY SYSTEM

### Abstract of the Invention

A means for obtaining efficient introduction of exogenous genes into a patient, with long term expression of the gene, is disclosed. The gene, under control of an appropriate promoter for expression in a particular cell type, is encapsulated or dispersed with a biocompatible, preferably biodegradable polymeric matrix, where the gene is able to diffuse out of the matrix over an extended period of time, for example, a period of three to twelve months or longer. The matrix is preferably in the form of a microparticle such as a microsphere (where the gene is dispersed throughout a solid polymeric matrix) or microcapsule (gene is stored in the core of a polymeric shell), a film, an implant, or a coating on a device such as a stent. The size and composition of the polymeric device is selected to result in favorable release kinetics in tissue. The size is also selected according to the method of delivery which is to be used, typically injection or administration of a suspension by aerosol into the nasal and/or pulmonary areas. The matrix composition can be selected to not only have favorable degradation rates, but to be formed of a material which is bioadhesive, to further increase the effectiveness of transfer when administered to a mucosal surface.